

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A multi-hop communication system configured by a radio control station connected to a core network and a plurality of radio stations for relaying signals therebetween, wherein,

the radio control station comprises:

a control signal transmission/reception unit configured to transmit/receive a control signal having a lower bit rate than an information signal and for conducting communication with the plurality of radio stations; [[and]]

an information signal transmission/reception unit configured to transmit/receive the information signal; and

a communication route determiner configured to determine a communication route through the multi-hop communication system for the control signal independently from a communication route through the multi-hop communication system for the information signal, prior to conducting communication with the plurality of radio stations, wherein the communication route determiner receives a usage inquiry from a radio station for inquiring usage of a communication channel handled by the radio control station and transmits/receives the information signal according to a usage notification that is a response to the usage inquiry, and

the each radio station comprises:

a control signal transmission/reception unit configured to transmit/receive the control signal; and

an information signal transmission/reception unit configured to transmit/receive the information signal.

2. (Canceled)

3. (Currently Amended) A radio control station connected to a core network for controlling communication by a radio station that relays a signals transmitted by other radio stations, comprising:

a control signal transmission/reception unit configured to transmit/receive a control signal having a lower bit rate than an information signal and for conducting communication with the radio station;

an information signal transmission/reception unit configured to transmit/receive the information signal;

a communication route determiner configured to determine a communication route through the multi-hop communication system for the control signal independently from a communication route through the multi-hop communication system for the information signal, prior to conducting communication with the plurality of radio stations, wherein the communication route determiner receives a usage inquiry from the radio station for inquiring usage of a communication channel handled by the radio control station and transmits/receives the information signal according to a usage notification that is a response to the usage inquiry.

4. (Previously Presented) The radio control station according to claim 3, the communication route determiner determines a communication route through the multi-hop communication system for the information signal by a different independent process from the determination of the communication route through the multi-hop communication system for the control signal.

5. (Previously Presented) The radio control station according to claim 3, the communication route determiner transmits a communication route acquisition request to the radio station for acquisition of a communication route, and the communication route determiner determines a communication route based on a response to the communication route acquisition request transmitted by the radio station.

6. (Previously Presented) The radio control station according to claim 3, further comprising:

a communication channel controller configured to transmit a usage notification that indicates usage of a communication channel handled by the radio control station.

7. (Previously Presented) The radio control station according to claim 3, the communication route determiner determines a communication route to the radio station and transmits a communication route determination notification that notifies the communication route to a radio station located on the communication route.

8. (Previously Presented) The radio control station according to claim 7, the communication route determiner assigns a communication channel to be used in the radio station located on the determined communication route.

9. (Currently Amended) A radio station conducting communication via a radio control station connected to a core network, the radio station comprising:

a control signal transmission/reception unit configured to transmit/receive the control signal having a lower bit rate than an information signal and for conducting communication with the radio station;

an information signal transmission/reception unit configured to transmit/receive the information signal; and

a communication route determiner configured to determine a communication route through the multi-hop communication system for the control signal independently from a communication route through the multi-hop communication system for the information signal prior to conducting communication with the plurality of radio stations, wherein the communication route determiner transmits a usage inquiry to the radio control station for inquiring usage of a communication channel handled by the radio control station and transmits/receives the information signal according to a usage notification that is a response to the usage inquiry.

10. (Canceled)

11. (Previously Presented) The radio station according to claim 9, further comprising:
a decision unit configured to decide whether or not communication is directly conducted with the radio control station based on a reception level of the control signal received by the control signal transmission/reception unit.

12. (Previously Presented) The radio station according to claim 11, the decision unit changes a threshold for the reception level according to a transmission speed of the information signal and to decide whether or not communication is directly conducted with the radio control station based on a result of comparison of the reception level and the threshold.

13. (Currently Amended) The radio station according to claim 9, further comprising:
a first relay controller configured to transmit a relay control signal to an other station for requesting a relay of the information signal and to set a communication route to the radio control station via the other station according to a response relay control signal that is a response to the relay control signal.

14. (Currently Amended) The radio station according to claim 13, further comprising:
a communication route selector configured to select a radio station satisfying a prescribed condition regarding a communication state if ~~a plurality of~~ the other radio station transmitted the response relay control signal.

15. (Previously Presented) The radio station according to claim 9, further comprising:
a second relay controller configured to receive a relay control signal requesting a relay of the information signal from other station, to transmit a response relay control signal that is a response to the relay control signal and to set a communication route from the other radio station to the radio control station.

16. (Previously Presented) The radio station according to claim 15, the second relay controller transmits the response relay control signal notifying ability of the relay of the information signal based on a reception level of the received response relay control signal.

17. (Previously Presented) The radio station according to claim 14, wherein an information indicating a number of hops from the other radio station to the radio control station is included in the response relay control signal, and the communication route selector selects a radio station based the number of hops included in the response relay control signal.

18. (Previously Presented) The radio station according to claim 14, wherein an information indicating an interference level is included in the response relay control signal, and the communication route selector selects a radio station based the interference level included in the response relay control signal.

19. (Currently Amended) A multi-hop communication method used in a system configured by a radio control station connected to a core network and radio stations that relay a signal transmitted from other radio stations, comprising the steps of:

transmitting a usage inquiry from the radio station for inquiring usage of a communication channel handled by the radio control station using a control signal having a lower bit rate than an information signal and for conducting communication with the radio control station and for conducting communication with the radio station;

determining a communication route through the multi-hop communication system for the control signal [[and]] independently from a communication route through the multi-hop communication system for the information signal by the radio control station,

transmitting from the radio station a usage notification indicating usage of the communication channel handled by the radio control station; and

transmitting/receiving an information signal to/from the radio station and the radio control station using the communication route determined based on the usage notification.

20. (Previously Presented) The multi-hop communication system according to claim 1, the communication route determiner determines whether or not the communication route for the information signal can be set based on a reception level of the control signal.

21. (Previously Presented) The radio control station according to claim 3, the communication route determiner determines whether or not the communication route for the information signal can be set based on a reception level of the control signal.

22. (Previously Presented) The multi-hop communication method according to claim 19, in the determining step, whether or not the communication route for the information signal can be set is determined based on a reception level of the control signal.

23. (Previously Presented) The radio control station of claim 3, wherein the communication route determiner is configured to determine the communication route, wherein the determined communication route includes at least one radio station.

24. (Previously Presented) The radio control station of claim 3, wherein the communication route determiner is configured to determine the communication route as a list of stations, the determination of the communication route being independent of an allocation of dedicated physical data channels used for communication between the stations.

25. (New) The radio station according to claim 14, wherein information indicating a required transmission power is included in the response relay control signal, and the communication route selector selects a radio station based on the required transmission power included in the response relay control signal.

26. (New) The radio station of claim 14, wherein the communication route determiner is configured to determine the communication route for the information signal that minimizes a total transmission power of radio station relaying the information signal.

27. (New) The radio station of claim 14, wherein the communication route determiner is configured to determine the communication route for the information signal by selecting a radio station having a smallest relative transmission power.

28. (New) The radio station of claim 14, wherein the communication route determiner is configured to determine the communication route for the information signal to maximize a signal-to-interference ratio while minimizing a number of hops in the communication route.